



Langley Research Center

LAPG 2570.5

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RADIO FREQUENCY SPECTRUM MANAGEMENT

National Aeronautics and Space Administration

Responsible Office: Systems Engineering Competency

LAPG 2570.5

PREFACE

The Radio Frequency (RF) spectrum management practices contained in this procedural guideline are based on established Federal regulations, Agency Policy and Procedures, and Government-industry standards, supplemented where necessary by a minimum of requirements peculiar to the NASA Langley Research Center.

The purpose of this procedural guideline is to set forth practices and responsibilities for the management and utilization of RF spectrum, particularly the purchase and use of RF frequency transmitting devices, at the Langley Research Center. This procedural guideline will be maintained by the Langley RF Spectrum Manager.

This LAPG rescinds LAPD 2570.5 dated March 7, 1997.

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1.0 INTRODUCTION

This guide sets forth the Langley Research Center (LaRC) procedures and responsibilities for the management of radio frequency spectrum requirements. This guidance is pursuant to NASA Policy Directive (NPD) 2570.5B, "Radio Frequency Spectrum Management," and NASA Handbook (NHB) 2570.6A, "NASA Radio Frequency (RF) Spectrum Management Manual."

2.0 DESIGNATIONS

In accordance with NPD 2570.5B, "Radio Frequency Spectrum Management," the Center Director designates the LaRC Spectrum Manager and Alternate. Both the Spectrum Manager and Alternate are located in the Systems Engineering Competency. The Spectrum Manager can be found in the LaRC Telephone Directory.

3.0 RESPONSIBILITIES

3.1. LaRC Spectrum Manager

3.1.1 Coordinate all the Radio Frequency (RF) spectrum requirements pertaining to activities and projects involving Langley Research Center (LaRC) with the Agency Spectrum Program Manager.

3.1.2 Maintain accurate records of all frequency assignments in use by LaRC activities and projects, whether on-site or off-site.

3.1.3 Maintain the electromagnetic integrity of the site by means of proper selection of RF equipment location and electromagnetic compatibility (EMC) testing, prior to issuance of radio frequency assignments.

3.1.4 Ensure the day-to-day interference-free operations at the site, and radio frequency interference (RFI) incident reporting.

3.1.5 Ensure that communications and RF spectrum requirements for future missions are identified as early as possible and reported to the International Program Manager for inclusion in NASA long range spectrum forecasts.

3.1.6 Participate in local or national spectrum management coordination groups, as appropriate, to provide representation and cognizance of LaRC's communications requirements.

3.1.7 Coordinate the development and maintenance of LaRC Procedures and Guidelines (LAPG) for Radio Frequency Spectrum Management.

3.1.8 Assign experimental call signs for NASA radio nets, when applicable.

3.1.9 Review all purchase requests for equipment intended to emit radio frequency signals to ensure that the spectrum support has been obtained prior to procurement.

3.2 LaRC Alternate Spectrum Manager

Assist and provide backup for the LaRC Spectrum Manager.

3.3 Individuals Assigned NASA Radio Frequencies

Adhere to the procedures set forth in this LAPG for Radio Frequency Spectrum Management and to the requirements and restrictions of the assigned Radio Frequency Authorizations (RFA's)

3.4 Office of Procurement

Ensure that the LaRC Spectrum Manager or Alternate has approved all purchase requests for equipment intended to emit radio frequency signals prior to procurement of the equipment.

3.5 Contracting Officers

Ensure that the affected contractors are apprised of, and comply with, the provisions of this LAPG, as required by their respective contracts.

3.6 Program Managers

Apprise the LaRC Spectrum Manager of the proposal and development of new projects that will require the use of the radio frequency spectrum.

3.7 Heads of Primary Organizations

3.7.1 Submitting all frequency authorization requests for use on LaRC and vicinity to the LaRC Spectrum Manager.

3.7.2 Complying with paragraph 7 of NHB 2570.6A when initiating action for either the development or procurement of communications or electronic systems requiring the use of the radio frequency spectrum.

3.7.3 Apprising the Spectrum Manager of previously authorized FCC or Interdepartmental Radio Advisory Committee (IRAC) radio frequencies prior to usage at LaRC and vicinity and withholding usage until approved by the LaRC Spectrum Manager and until local authority has been issued.

3.7.4 Promptly reporting radio frequency interference (RFI) to the Spectrum Manager.

3.7.5 Assisting LaRC management and the Spectrum Manager when interference is reported.

3.7.6 Assuring compliance with this procedural guideline in requesting and utilizing frequency assignments.

3.7.7 Enforcing transmission restrictions as posted.

4.0 DEFINITIONS

4.1 FREQUENCY ALLOCATION - The process whereby a portion of the radio frequency spectrum is set-aside for a particular use or service.

4.2 FREQUENCY ASSIGNMENT - The authorization for the use of a particular frequency for either Government or non-Government operations.

4.3 RADIO FREQUENCY AUTHORIZATION (RFA) - The authorization for the use of specific radio equipment on assigned frequencies.

4.4 SPECTRUM MANAGEMENT - For the purpose of this procedural guideline, this term includes, but is not limited to, the following:

4.4.1 Coordinating and consulting with appropriate technical personnel regarding procurement description of electronic radiating devices within portions of the radio frequency spectrum as they affect LaRC.

4.4.2 Coordination of the use of radio frequencies at LaRC and at other locations.

4.4.3 Allocation of frequencies.

4.4.4 Assignment of frequencies.

4.4.5 Efficient use of the radio frequency spectrum.

4.4.6 Reducing radio frequency interference (RFI).

5.0 ADMINISTRATIVE PROVISIONS FOR RADIO FREQUENCY SPECTRUM MANAGEMENT

5.1 Radio Frequency Authorization

A Radio Frequency Authorization (RFA) must be issued by the Spectrum Manager prior to the operation of any communications or electronic equipment that intentionally radiates or re-radiates radio frequency signals.

5.2 Radio Frequency Authorizations Requests (RFA)

RFA's are obtained by completing a Radio Frequency Authorization Request form (LF 400) and submitting it to the Spectrum Manager. Minimum processing time is at least 90 days for requests for use periods of one year or less and 180 days for requests for a use periods of more than one year. It is not unusual to take much longer. Users are advised to submit their requests as soon as possible. Forms are available at the Spectrum Manager's Office and on the Spectrum Management Web site.

5.3 Procurement Authorizations

It is Federal policy (OMB Circular No. A-11) that, pending assurance of the availability of the appropriate RF spectrum support, no funds will be obligated for the research, development or acquisition of components; for modification of major communications and electronics equipment or systems; or for the selection, procurement and deployment of space or terrestrial radio stations and facilities when such items require RF spectrum support. Approved RF requirements must be made a part of the specifications included with the procurement request or requisition. This policy was adopted to ensure the purchase of appropriate equipment that is designed to operate in Federal radio bands.

5.4 Use of FCC licensed devices

5.4.1 In the United States, the National Telecommunications and Information Administration (NTIA) manages the Federal Government's use of the radio frequency spectrum while the Federal Communications Commission (FCC) manages all other uses. To allow the two agencies to effectively manage the spectrum for their respective users, there are specific allocations for Federal use and non-Federal use. All radio stations that are operated by or for the Federal Government receive "frequency assignments" from the NTIA and must operate in the portions of the spectrum that are allocated for Federal Government use. All other users receive operating licenses issued by the FCC for frequencies in the non-Government spectrum allocations. Non-Government users (contractors, private individuals, etc.) may use FCC licensed devices at LaRC subject to the following restrictions:

5.4.1.1 Because they are employees of the Federal Government, civil service personnel may not normally utilize RF devices that operate in the non-Government spectrum in the performance of their official duties. Exceptions can be made when it is necessary for Government and non-government users to communicate on the same frequency such as Police, Fire and other Emergency situations. (For cellular telephones, see 5.4.5)

5.4.1.2 Equipment that is purchased with Government funds, either outright or GFE, is considered to be a Government Radio Station and may not be operated on frequencies within non-Government (i.e.-FCC) spectrum allocations.

5.4.1.3 When the use of FCC licensed devices is permitted, the user must possess a valid FCC license and must receive a RFA from the Spectrum Manager prior to using the devices.

5.4.1.4 The devices must not cause interference to NASA's official-use communications systems. If interference occurs, use of the devices must be terminated until the cause of the interference is resolved.

5.4.1.5 Resolution of RFI caused by a FCC licensed device is the responsibility of the user.

5.4.2 Contractors should request RFA's through the cognizant Contracting Officer. A copy of the user's FCC license must accompany the request. The devices must be retained by the Contractor when the contract is terminated.

5.4.3 The use of hand-held and mobile voice communications equipment by private individuals who hold a valid FCC license in the Amateur Radio Service, Citizen's Radio Service (CB), or General Mobile Radio Service (GMRS) does not require an RFA; however, users who are found to be violating FCC Rules and Regulations will lose their privilege to operate on LaRC. The use of all non-voice communications equipment (radio control, data transmission, etc.) does require an RFA.

5.4.4 The limited use of FCC-licensed devices by the broadcast media does not require a RFA as the broadcast media is regulated by the FCC. However, a copy of the FCC license for all frequencies that will be used at LaRC may be required by the LaRC Spectrum Manager.

5.4.5 RFA's are not required for the use of cellular telephones.

5.4.6 No radio transmissions will be permitted in areas so posted.

5.5 Use of low power, non licensed devices

5.5.1 The use of low power, non licensed devices, including wireless local area networks and wireless microphones, is permitted at LaRC, provided that the devices meet

the requirements of Part 15 (47 CFR 15) of the FCC Rules and Regulations and Annex K of the NTIA Manual.

6.0 RADIO FREQUENCY INTERFERENCE (RFI)

6.1 The probability of radio frequency interference (RFI) increases as more demands for frequency channels (assignments) are placed on the RF spectrum. In an attempt to meet these demands and to optimize the use of the spectrum, the space between channels is minimized within the limitations imposed by the state-of-the-art development of electronic equipment; the same frequencies are often shared by frequency users separated geographically; or the same frequencies may be assigned to two or more users on a time-share basis. Because of this, some interference must be expected (and even tolerated) since, ordinarily, clear channels are not available within the overcrowded frequency spectrum. If interference is so severe that it cannot be tolerated, the frequency user will take action as follows:

6.1.1 Promptly document the interference indicating date, time, and location.

6.1.2 Thoroughly check the affected equipment to ensure that the equipment is operating properly according to the manufacturer's specifications and to the specifications of the Radio Frequency Authorization.

6.1.3 If possible, identify the source of the interference by call sign (or other identification).

6.1.4 Measure the frequency or band of frequencies causing the interference.

6.1.5 Determine the type of emission and the type of traffic being transmitted.

6.1.6 Measure the bandwidth of the interfering signal (highest and lowest frequencies) and note the type of equipment used for measurement.

6.1.7 Measure the interference signal strength with a high quality field strength meter. (Request technical assistance, if necessary.)

6.1.8 Determine the nature or severity of the interference, indicating the impact to operations including data loss or degradation.

6.1.9 Supply any additional information that is necessary or useful in identifying and clearing the RFI (e.g., tape recordings or spectrum photographs).

6.1.10 Immediately report the RFI to the Spectrum Manager's office, providing all information described above where possible. The above information must be submitted to the National Program Manager for each incident of major interference as per NHB 2570.6A.